

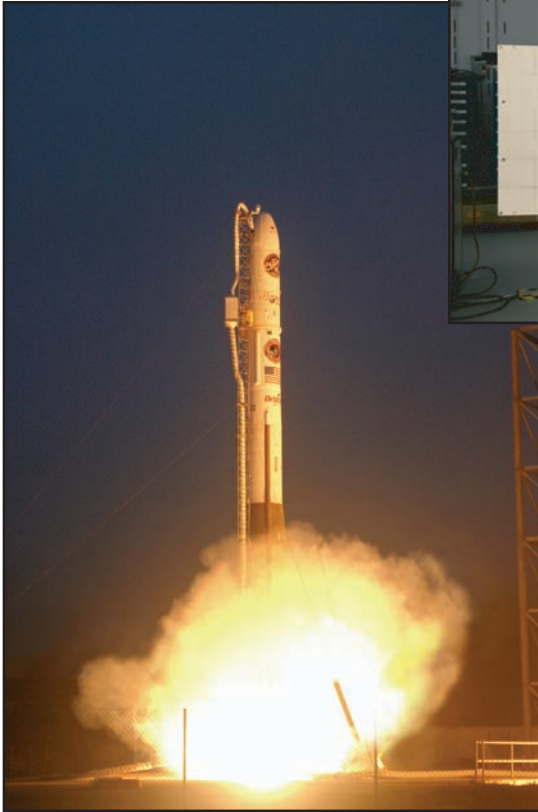


Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

TECHNOLOGY MILESTONES

AFRL'S XSS-11 SUCCESSFULLY LAUNCHES



AFRL developed the \$80 million Experimental Spacecraft System (XSS-11), a new class of low-cost satellites that weigh roughly 100 kg. The XSS-11 will demonstrate technologies that will help to reduce the costs of operating, launching, and building a satellite. The XSS-11 will also help to pave the way for future space servicing, diagnostics, maintenance, and space support missions.



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Space Vehicles
Support to the Warfighter
Space

Accomplishment

Scientists launched the XSS-11 into orbit on the Minotaur small launch vehicle from Vandenberg Air Force Base, California. The orbit had a 98.8° inclination, almost perfectly circular, at an altitude of about 850 km. The XSS-11 successfully completed its launch and early orbit operations as scientists carefully turned on, thoroughly tested, and fully characterized each subsystem. The XSS-11 has a 9ft wingspan and, at approximately the size of a dishwasher, is much smaller than a typical satellite.

Background

The XSS-11 will demonstrate the ability to autonomously plan and complete rendezvous operations with approved space objects near the satellite's orbit. During its 12- to 18-month space mission, the satellite will rendezvous with 6-8 approved, US-owned objects—inactive or dead research satellites or spent rocket stages—in its orbit.

A sophisticated onboard planner enables the XSS-11 to encounter these objects. The onboard planner is a radiation-hardened Power PC 750 processor, which provides the XSS-11 the ability to autonomously plan operations. The planner will consider a series of objectives (e.g., going to an expended rocket body) and constraints (e.g., waiting for approval from the ground) and build a plan to accomplish the objectives with respect to those constraints.

Additional Information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (VS-S-05-08)

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